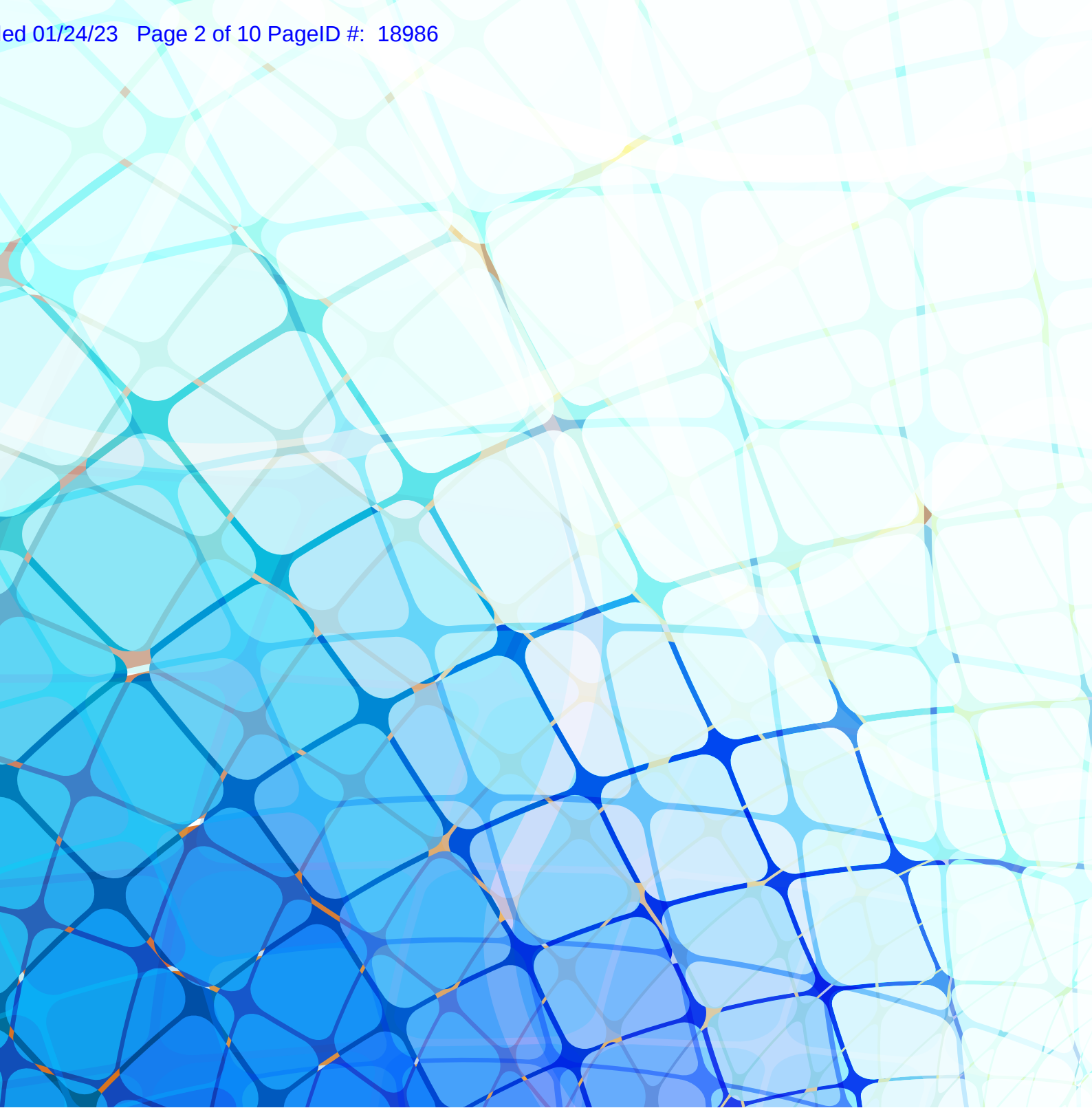


EXHIBIT I



Understanding patents, competition & standardization in an interconnected world

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Understanding patents, competition and standardization in an interconnected world



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The opinions expressed in this publication are those of the principal authors and do not necessarily represent the views of the ITU. Nothing in this publication is to be considered as an authoritative interpretation of the ITU-T/ITU-R/ISO/IEC Common Patent Policy and related Guidelines as this publication is only intended for educational and informational purposes.

Foreword

The intention of this publication is to provide government officials, private-sector executives and industry analysts of all disciplines with an overview of the current state of play in the interrelationship of intellectual property and standardization in the information and communication technology (ICT) sphere. It provides a high-level introduction to standardization and intellectual property systems and the various means with which ICT standards bodies manage their intersection. Building on these fundamental concepts, the publication explores recent years' uptick in litigation involving standard-essential patents to provide readers with the basis necessary to engage with ITU's ongoing evaluation of possible reform to the ITU-T/ITU-R/ISO/IEC Patent Policy and related Guidelines.

Intellectual property rights (IPR) and technical standards are essential ingredients in driving market growth, mutually beneficial trade and economic development. And while the two systems seem at cross-purposes – intellectual property consolidating innovation's financial returns in the hands of inventors; standards publishing specifications designed for global adoption – both play complementary roles in providing a basis for iterative innovation and technological advance.

The ICT industry relies on intellectual property and standardization to an extent rivalled by few other industry sectors. The history of communications is one characterized by inventive step after inventive step, leading players in the ICT sector to amass an unparalleled volume of intellectual property. Technical standardization establishes engineering norms for technical systems and is crucial in capturing and further stimulating innovation, providing the lifeblood to ICT networks in need of common protocols or 'languages' to enable compatibility and interoperability.

Technical standards seek to reflect the state of the art and may include patented technologies by virtue of their drawing on the best available technologies to formulate specifications that ensure ground-breaking innovations can be shared across the world.

Managing the incorporation of patented technology in ICT standards demands a precise balance of the interests of IPR holders and standards implementers. IPR holders need an assurance of reasonable compensation for the adoption of their IPR-protected innovations to motivate their contribution of such innovations to standards development processes. Potential standards implementers similarly require the security of a reasonable IPR licensing fee to motivate their conformance with standards.

ITU's Telecommunication Standardization Sector (ITU-T) has garnered many years of experience with the complexities of patents' inclusion in standards through its longstanding commitment to the consensus-driven development of 'open standards'. In 2007, based on best practices determined by ITU-T Study Groups, a common ITU-T/ITU-R/ISO/IEC Patent Policy and related Guidelines were established as a unified governing framework for the three international standards bodies' approach to 'standard-essential patents' (SEPs).



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8. The challenging relationship between patents and standards

The complex relationship between patents and standards is the subject of heated debate worldwide.

Although the patent and standardization systems both aim to support and incentivize innovation and technological progress, the intersection of these two mechanisms may give rise to various tensions and conflicts. The standardization system is based on the assumption of commonalities, creating an even playing field for competition by granting stakeholders equal access to innovative solutions. Conversely, the patent system is based on the award of temporary monopolies borne of IPR holders' ability to exclude others from implementing protected technologies. The contrasting principles of the inclusivity of standards and exclusivity of IPR do not meet without complexity.

Standardization processes open to participation by all interested parties – such as those of formal SDOs, quasi-formal SDOs and many forums and consortia – usually involve the cooperation of numerous ICT market players, often with very different commercial interests and business models. Open standardization processes intend to ensure that resulting standards reflect the needs of different standards implementers, also creating an environment where a standard's development can benefit from the multifaceted expertise, knowledge and insight gained by assembling stakeholders that represent a broad cross-section of the ICT industry.

In a typical standardization process, it is the participants that drive a standard's development by proposing the inclusion of what they deem to be the most appropriate methodologies, technologies or technical solutions. The development of such methodologies, technologies or technical solutions is often a complex, costly endeavour demanding investments in R&D that can span several years. Yet, for a variety of reasons, many companies volunteer their patented innovations for inclusion in standards. Standards can incorporate literally thousands of patents, and the associated difficulties have been compounded by the fact that the development of standards sometimes anticipates the progression of technology rather than following it.

A standard-essential patent (SEP) is one that is indispensable to the implementation of a standard. A patent is considered standard-essential if the text of a standard is drafted in such a way that it becomes impossible to implement the specifications of the standard without using the technology protected by the patent. While there may be (and usually are) many patent-protected innovations able to add value to standards-based products, these are not necessarily essential as per the above definition. For instance, patented technology related to an integrated phone antenna might add to the functionality of a standardized antenna, but such patents will not be considered standard-essential if the specifications of the relevant standard do not require the use of this technology.

Most standards bodies have developed IPR policies that allow for companies' patent-protected innovations to be reflected in standards, provided that such intellectual property is made available to all standards implementers under royalty-free or reasonable and non-discriminatory (RAND) terms and conditions.

While the inclusion of patented technology in standards might have been an incidental matter in the past, it is very common today.⁶⁴ One explanation for this is that the inclusion of patented technology adds to standards' ability to improve ICT performance, cost-effectiveness, connectivity or interoperability. Another is that patents have come to cover a larger portion of our society's overall knowledge base. A further, complementary explanation for the increase in SEPs is that they serve the strategic interests

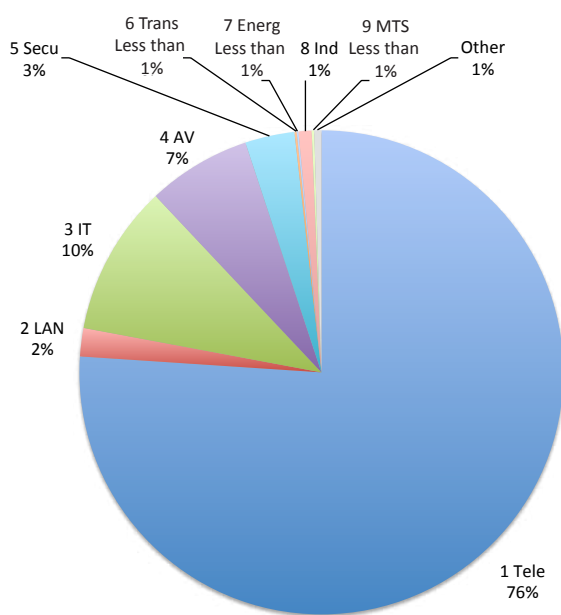
⁶⁴ The recently compiled Open Essential IPR Disclosure Database (OEIDD) of SEPs in thirteen large standards-setting entities shows that there have already been over 45,000 patents disclosed as potentially essential.

of market players, which see considerable benefit to having their patented technologies selected as part of a standard.

Companies owning SEPs benefit from new revenue-generating opportunities in that every implementer of a standard is *by definition* infringing the associated SEPs unless they acquire licences to these SEPs from their owners. SEP owners possess strong bargaining positions in cross-licensing deals that grant them access to other patents. Companies also benefit from contributing patented technology to a standard because the widespread adoption of that standard might signify a change in market direction that suits a SEP owner's strengths and expertise or existing products, platforms and clients, thereby giving them a competitive advantage by virtue of their having less need than their competitors to remodel their product offerings.

It should be noted that the distribution of SEPs is skewed in several ways. In terms of technology areas, the lion's share of SEPs are found in the field of telecommunications.

Figure 8-1 – Disclosed SEPs by technology class⁶⁵



Technology area legend:

1 Tele	Telecommunications via public networks
2 LAN	LAN/PAN/BAN networks, wired and wireless
3 IT	Information technology and Internet
4 AV	Audio/video systems, coding and compression, broadcasting, home systems, home entertainment
5 Secu	Security, identification, cryptography, biometrics
6 Trans	Transport, logistics, aerospace, intelligent transport systems (excl. areas in the above categories)
7 Energ	Energy generation and distribution and storage, fuel cells, power electronics
8 Ind	Industrial equipment, manufacturing, production
9 MTS	Measurement, testing, safety standards, language standards
Other	[A wide variety of topics that do not fit into the above categories]

⁶⁵ Calculations on the basis of the OEIDD database. See also Bekkers, R., Catalini, C., Martinelli, A., & Simcoe, T. (2012). Intellectual Property Disclosure in Standards Development. NBER conference on Standards, Patents & Innovation, Tucson (AZ), January 20 and 21, 2012. Available: <http://users.nber.org/~confer/2012/IPKE/Bekkers.pdf>

11. Specific concerns and issues with patents in standards

Few issues receive more attention in the ongoing debates concerning SDOs' IPR policies than the meaning of the RAND commitment. Identifying the appropriate royalty and licensing terms for RAND-declared SEPs, and understanding how the RAND commitment limits the relief available to the patentee for infringement of SEPs, are important aspects of the 'quest for balance' that IPR policies seek to strike between, on the one hand, the goals of fostering competition and widespread adoption of the standard and, on the other, the desire to reasonably reward innovation and technical contributions to standards development.

Because most SDOs' IPR policies do not explicitly define specific parameters or requirements for RAND licensing, debates regarding the meaning of the RAND commitment can arise in private licensing negotiations as well as in litigation between parties that cannot agree on RAND licensing terms for their SEPs. More recently, competition agencies in the US and EU have offered input, and SDO members have debated whether and how SDOs might revise existing IPR policies to clarify or codify RAND licensing principles. This section addresses six significant issues raised in these negotiations, litigations and policy debates, and summarizes the concerns and views that have been offered in relation to each.

Many of the positions identified in this section arise from concerns relating to patent 'hold-up', *i.e.* abuse by the patent holder of its position after a standard has been completed. In addressing these concerns, an SDO that has adopted RAND policies needs to be careful not to restrict a patent holder's ability to obtain, in good faith, reasonable compensation for use of its technology in the standard.

The patent hold-up concern arises because many practitioners of the standard (that is, potential licensees in SEP licensing negotiations) have invested substantial resources in developing and marketing products that comply with a given standard, to the point where it would not be economically feasible, and not good for promulgation of the standard, for that company to shift to non-compliant products or to withdraw from the market altogether. Because a SEP by definition cannot be worked around, it can obtain market power if there is a marketplace demand for products to conform to the standard in question. Once companies have made such investments, they can become 'locked into' a standard for all practical purposes, and can be vulnerable to efforts by a given SEP holder to extract exorbitant royalties far in excess of the value of the underlying patented technology. Thus, without some constraint on the SEP holder's ability to maximize royalties for SEP licensing, a locked-in manufacturer may become compelled to pay grossly excessive, non-RAND royalties rather than risk an injunction that would render it unable to market standard-compliant products, and then pass these extra costs onto consumers. In fact, many commentators argue that those hold-up situations raise competition law concerns and preventing hold-up is a primary purpose of the RAND commitment, and that the scope of the RAND commitment should be interpreted accordingly.⁸⁸

On the other hand, many SEP holders have invested significantly in research and development for standardized technology, and the RAND commitment allows for 'reasonable' compensation for the SEP holder. Some SEP holders have raised concerns that policies limiting a SEP holder's rights when enforcing SEPs (such as limitations on the right to seek injunctions for infringement), or policies limiting

⁸⁸ Farrell, Joseph *et al.* (2007), 'Standard Setting, Patents, and Hold-up,' 74 Antitrust L. J. 603 (discussing SEP hold-up); *Broadcom v. Qualcomm*, 501 F.3d 297, 313-14 (3d Cir. 2007) ('When a patented technology is incorporated in a standard, adoption of the standard eliminates alternatives to the patented technology. Although a patent confers a lawful monopoly over the claimed invention its value is limited when alternative technologies exist. That value becomes significantly enhanced, however, after the patent is incorporated in a standard. Firms may become locked in to a standard requiring the use of a competitor's patented technology. The patent holder's IPRs, if unconstrained, may permit it to demand supracompetitive royalties. It is in such circumstances that measures such as FRAND commitments become important safeguards against monopoly power.') (internal citations omitted).

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